

WHAT IS CLAIMED IS:

*Sub A2*

1. A method for decreasing sulfur levels in a mercaptan sulfur containing hydrocarbon feedstream comprising the steps of passing said mercaptan sulfur containing hydrocarbon feedstream over a fixed bed catalyst in a three phase, gas, liquid, solid, system in the presence of a stripping gas, for a time and at a temperature and pressure sufficient to decompose at least a portion of said mercaptans to produce olefins  $H_2S$ , as an off gas, and a hydrocarbon product stream having decreased levels of mercaptan sulfur and to disengage said hydrocarbon product stream having decreased amounts of mercaptan sulfur from said  $H_2S$  and said stripping gas and wherein said stripping gas is hydrogen, said fixed catalyst bed comprises (a) a non-reducible metal oxide or (b) a Group VIIIB metal promoted Group VIB catalyst, and wherein when said stripping gas is an inert gas or hydrogen, said fixed bed catalyst comprises a Group VIIIB metal promoted Group VIB catalyst.
2. The method of claim 1 wherein said inert gas is selected from helium, nitrogen, argon, methane, natural gas, light ends and mixtures thereof.
3. The method of claim 1 wherein said non-reducible metal oxide catalyst is selected from alumina, silica-alumina, magnesium oxide, and mixtures thereof and said Group VIIIB promoted Group VIB catalyst is selected from the group consisting of cobalt, and nickel promoted molybdenum catalysts.
4. The method of claim 2 wherein when said stripping gas is gas comprising hydrogen and said catalyst is a Group VIIIB promoted Group VIB catalyst, said stripping gas comprises no more than 1/2 mole % hydrogen sulfide and no more than 50 mole % hydrogen.

*Sub C1*

*Sub A3*

5. The method of claim 1 wherein said mercaptan sulfur containing hydrocarbon feedstream is a hydrodesulfurized feedstream.

6. The method of claim 1 wherein said method includes a hydrodesulfurization step to produce said mercaptan sulfur containing hydrocarbon feedstream.

7. The method of claim 6 wherein said hydrodesulfurization step is SCANfining.

8. The method of claim 1 wherein said mercaptan sulfur containing hydrocarbon feedstream is a C<sub>5</sub> mercaptan containing feedstream.

9. The method of claim 1 wherein said three phase system is a countercurrent system.

10. The method of claim 1 wherein said three phase system is a concurrent system.

11. The method of claim 3 wherein said catalysts are sulfided catalysts.

12. The method of claim 1 wherein said mercaptan sulfur containing hydrocarbon feedstream contains less than 30 ppm of non-mercaptan sulfur.

13. The method of claim 1 wherein said mercaptan sulfur containing hydrocarbon feedstream contains less than 30 ppm of non-mercaptan sulfur and greater than 30 ppm of mercaptan sulfur.

14. The method of claim 13 wherein said mercaptan sulfur containing feedstream is produced from a hydrodesulfurization process.